

# Chapter 1

# Engine will not start from cold

You may be wondering just where to start in what is a fairly extensive list of causes for why your car has decided not to start. In an effort to help you focus upon the reasons most applicable to your situation I have split this chapter into three basic sub-sections -

- **Engine cranks with, or close to, its normal vigour: 1-1**
- **Engine cranks, but slowly: 1-2**
- **Engine will not crank: 1-3**

I hope these very basic diagnoses will help you get going again as quickly as possible, though you need to appreciate that there may be more than one reason why your car won't start.

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## ENGINE CRANKS AT OR CLOSE TO ITS NORMAL VIGOUR

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Consider whether the car has been reluctant to start first thing in the morning for some time, which may mean you need to check for one set of potential faults; whether it has been progressively harder to start as the colder weather advances; or whether the car has generally been starting easily until this occasion.

Engine has been reluctant to start for some time

**1-1-1** This symptom suggests that the general tune of the engine is slowly

deteriorating and that, at the very least the ignition, and possibly the carburation, need servicing. However, consider first whether the engine is turning over as briskly as it did. If not, check the fan/drivebelt tension and the battery and its connections. If the battery is at the correct acid level and there's no corrosion on the terminals, check the engine earth (ground) connection to the chassis. The braided "loop" or "earth strap" is required to ensure that the electrical return from the starter motor has an easy path to earth past the rubber engine and gearbox mountings. The strap's position can vary depending upon the year the car was manufactured, but chrome bumper cars were earthed across the left side engine mounting and later cars between the gearbox and body. Rust creeps into the interface between strap and body and creates a barrier. You need to thoroughly clean the contact areas of the strap, lightly cover in petroleum jelly/Vaseline, fit new washers and tighten securely.

If the car has not been serviced recently it would be sensible to carry out a full service. At the very least change the engine oil and filter, the fuel filter (if fitted), sparkplugs and contact breaker points, and clean the inside and outside of the distributor cap and ensure the central contact is in good order.

With the distributor cap off, check that the rotor arm is clean in the centre

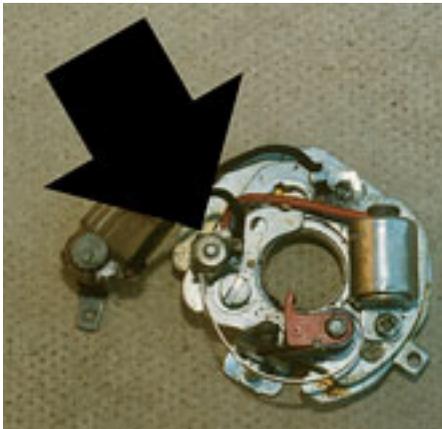
and at its periphery, and that the cap's four internal contacts are not worn, pitted or damaged. Check that the vacuum



**1-1-1 (Picture 1) Unfortunately, but unavoidably, there are numerous connections within the ignition circuits that can result in a no-start situation. A frequently overlooked but important distributor of the high tension spark is the rotor arm, shown here. The centre terminal (arrowed) must make good contact with the carbon brush in the centre of the distributor cap (see picture 3). This is an early Lucas 25D model distributor which was superseded by the introduction of the rubber bumper cars with...**

rain that you suspect, bear in mind that it needs to be pretty heavy to splash-up to the level of the electrics. Furthermore the event of water splashing up on to the ignition electrics it is more likely that the engine will missfire for a few seconds and then die completely. So if the missfire continues for a few minutes getting neither better nor worse, it probably is not caused by dampness/water, so read on.

**3-1-3** If you're experiencing bad (and possibly worsening) engine performance, but the engine does at least keep going, the probability is that the condenser in the distributor is going "open-circuit." In other words it is as if there were no condenser, and the consequence of this type of fault is that the points burn very quickly and that the ignition circuits don't function as well as they were designed to - hence the poor engine performance. Typical



**3-1-3 Changing the condenser and/or points beside the road is no fun, particularly if it's an operation you're unfamiliar with. Many would advocate removing the whole distributor, but I think the job is easier if you've followed my suggested list of spares and have a spare baseplate for the distributor, complete with a serviceable set of points and condenser; they don't have to be new. This baseplate is from the Lucas 25D distributor of an early/chrome bumper car; the 2BA retaining nut (arrowed) gives this fact away. Later cars had a Lucas 45D series distributor with a sliding spring mounting superseding the 2BA nut.**

consequences are very slow acceleration, missfiring and a very curtailed rev-range. If you're experiencing any such symptoms, by far the best solution is to replace the condenser and contact breaker points as

a matter of course for the small sum they cost. The condenser is an item that takes up very little space, so always carry a spare. Unfortunately, there is no easy test to establish whether a condenser is faulty - hence my suggestion that you substitute a new one in any circumstances where the ignition system is giving cause for concern. Condensers can start off the day perfectly serviceable, but, usually when hot, start to become progressively less and less effective.

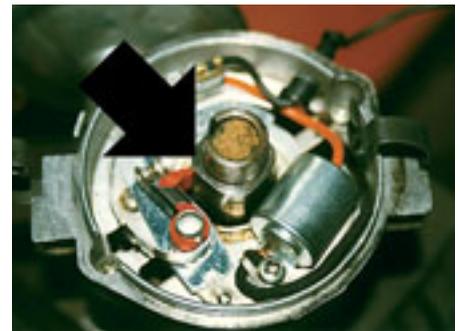
Lift the cap off the distributor and take a careful note of where things go around the distributor's points/condenser. I know you're broken down and are in a hurry to get going again, but if you're not familiar with ignition systems, it really is worth taking a couple of minutes to sketch the routing of the various wires and the order of assembly of the low tension wires and insulator. Note, for example, that you do **not** need to disturb the points unless they are burnt and need changing. Unscrew the crosshead screw that secures the condenser and the top 2BA nut on top of the pillar carefully (it is **very** easy to drop either, or both) and ease up the washer and then the usually white(ish) top hat-shaped insulator. Put both on one side out of harm's way and concentrate on the two ring terminals now left on the pillar. You may find that the condenser's terminal is on the top in which case it is a simple case of just removing the whole condenser and replacing it. If you happen to find the input wire's ring termination on top, lift that gently away for a second, remove the condenser and replace the terminals loosely on the pillar in any convenient order. The next step is one of the key details that must be done correctly. Put the top hat insulator back on the pillar such that it goes **through** the two wiring eyes and the pivot arm of the points and that these three components are insulated from the other low tension ignition components in the area. You should have the flat (wide) top of the insulator looking up at you, ready to accept the washer and 2BA nut - which you'll note can be screwed down but will be insulated from the two ring terminals and the point's pivot. Secure the condenser, put the cap back on the distributor and try the engine.

**3-1-4** Even a correctly serviced car can experience problems. A degenerating condenser can burn or "pip" the points and cheap non-original equipment points sometimes have cam-followers made from soft material that wears prematurely. Both



**3-1-4 (Picture 1) This picture shows the condenser (screwdriver points to it), the distributor cam (arrowed) and gives another general view of the Lucas 45D distributor...**

reduce the ability of the points to open and close properly. Further, it's possible that the points securing screw was not quite pinched-up tight or even that the car was not properly serviced! Whatever the underlying reason, unless you have electronic ignition (fitted as standard to US MGBs from 1976 and retro-fitted to numerous UK cars of all years) the contact breaker points need to open and close as the distributor's cam rotates. If your car's points have virtually closed up, they will not be making and breaking the primary (low tension) ignition circuit as intended.



**3-1-4 (Picture 2) ...whilst here we highlight the cam follower or "heel", which can prematurely wear if you fit a cheap contact breaker set and/or fail to lubricate the cam. Note the slot for points adjustment on the 45D.**

To check, remove the cap from the top of the distributor. Be careful not to disturb any of the high tension lead connectors but push the cap/leads back out of the way. The cap cannot and need not move far as the sparkplug leads will prevent it, but you want to be able to see into the

push the car forward until number eight valve has been pushed fully down by its rocker. Handbrake on, and adjust number one tappet. Handbrake off, roll the car slowly forward until number 7 valve is fully depressed and put the handbrake on. By the "rule of 9" we know that 9 minus 7 allows us to adjust number 2 tappet with confidence. Proceed with the "rule of 9" until all tappets have been adjusted.

- Ideally, refit the rocker cover with a new gasket, but I must admit I rarely bother with the new gasket unless the original one has cracked/broken.

Not forgetting to select neutral, try the engine. Don't panic if she still rattles a little bit on start-up, the real test is whether the engine rattles when hot. The rattle should at least have decreased. If the engine still rattles a little there is probably no real problem, for the MGB engine has a reputation for tappet noise. Indeed, you can buy a cast aluminium rocker cover that not only looks better than the original pressing but also reduces the almost inevitable tappet rattle. However if the engine rattles as badly as ever, you need to read on ...

**6-8-1** A rattling or ticking noise that remains even with the tappets are correctly gapped and whether the car is static or on the road can signal worn cam followers

or a worn camshaft. Further diagnose this problem by placing a 0.010in feeler between each rocker and valve stem in turn with the rocker cover off and the engine idling. The ticking will stop with the feeler in place and restart when you withdraw it if your engine is suffering from these problems.

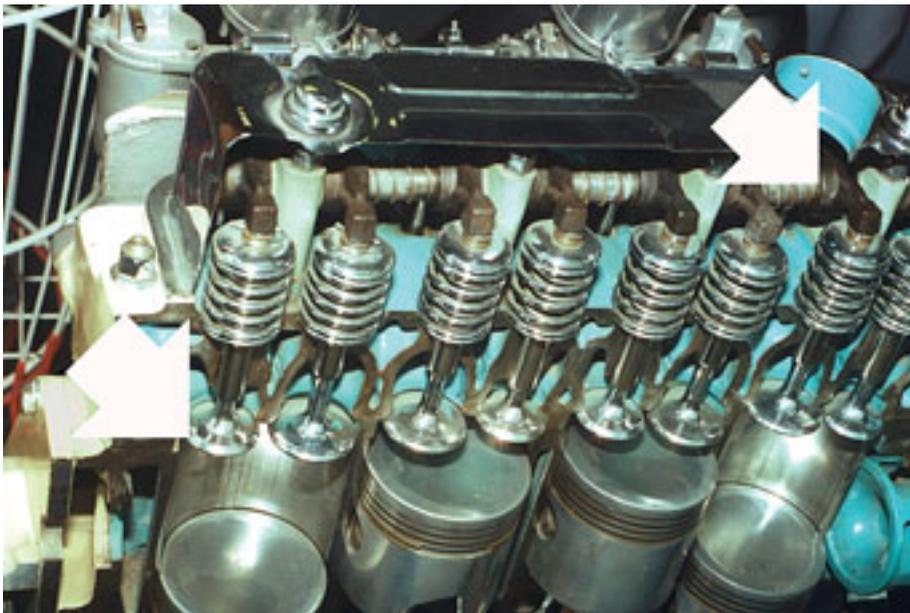
**6-9-1** If the engine still has very noisy top end even after adjusting the tappets, the engine probably has a worn rocker shaft and/or worn rockers. As you may have guessed, it is not the valve contact faces of the rockers that have worn, but rather the rocker bores such that they are slopping about and thus rattling on the (probably also worn) shaft on which they pivot. This would not be an unusual problem by any means.

To check, remove the rocker cover, the four retaining nuts and remove the rocker shaft assembly complete. Each rocker should pivot on the shaft without restriction but there should be no obvious clearance between any rocker and its shaft. In this circumstance you should expect to find several if not all rockers can be moved up/down on the shaft signifying excessive clearance between rockers and shaft due to wear.

You can buy all of the rocker/shaft components individually, but if most of



**6-10-1** An example of AWAs (Anti-wear additives) intended to reduce valve seat recession (VSR). The bottle is squeezed until the top measuring part (arrowed) is filled.



**6-9-1** The rocker shaft and bearing (arrowed) that eventually wears. The shaft and this bearing work under the constant upward pressure of the valve springs, so some wear is inevitable over time. Not related, but also highlighted is a valve seat: these need to be harder in an engine using unleaded fuels (see 6-10-1).

the rockers are worn the simplest and most cost-effective solution is to purchase a complete new assembly. There are two types of rocker pillar - with a central oil passage or an offset one: check which you require before ordering.

**6-10-1** If tappet rattle returns or increases within a relatively short distance (say 3 or 4000 miles) of adjusting the valve clearances the engine could, in these days of lead-free fuels, be suffering from valve seat recession (VSR) and you need to be alert to this possibility. While this does not help those readers outside the UK, nevertheless many may be interested, even surprised to learn that leaded petrol is still available from certain retailers around the UK and that the list is growing all the time. The coverage is national and there should be at least one source in every reasonably sized town. If this interests you and is a potential solution to your VSR, take a look at <[www.bayfordthrust.co.uk](http://www.bayfordthrust.co.uk)>. The first corrective step is to re-adjust the tappets and, I suggest, you make a note somewhere as to the recorded mileage. If you're fairly sure that the car's cylinder head has not been modified for the use

## AUTO-DOC SERIES

gaiters/boots (the rubber bellows at each end of the rack) for cracks or holes from which oil may have leaked. If necessary, change the gaiters. Although not necessary to remove the steering rack, the ball joints at each end of the rack must be removed in order to slip the new gaiters onto the end of the rack - which, unfortunately, will upset the tracking (more on this shortly).

After changing the gaiters top up the



**10-11-1 (Picture 3)...**and almost certainly will need a ball joint splitter to...



**10-11-1 (Picture 4) ...**separate the tapered shoulder on the ball joint from the track control arm.



**10-11-1 (Picture 5)** Count the number of turns off the trackrod for each ball joint, and the number back on again, although it's still best to get the tracking checked afterward.

rack with the recommended oil. This is most easily achieved by jacking the car so that it is tilted sideways, and releasing the clamp that secures the gaiter to the track rod (usually a plastic tie), and syringing in the oil. Refasten the open end of the gaiter to achieve an oil-tight seal.

Provided you measured the centres



**10-11-1 (Picture 6)** Once the inner end of the gaiter is secured to the rack with the clip supplied in most gaiter kits...



**10-11-1 (Picture 7) ...**a syringe will be necessary to inject the (thickish) EP90 oil into the rack through the small end of the gaiter. You may or may not get a cable tie-type clip in your kit...



**10-11-1 (Picture 8) ...**but one will be necessary to seal the small end of the gaiter to the trackrod.

of the ball joints and replicated that after fitting the new gaiters, the resultant wheel tracking should not be too inaccurate. Try the car for a few days and, if there's an improvement, get it professionally tracked. If no improvement, it's time to consider the rack itself.

### Excessive play/lash at steering wheel

**10-12-1** Play in the steering can also cause the car to wander, with the almost inevitable over-correction making the problem worse. This play is the result of wear within either the steering rack or the universal joint (UJ) within the steering column. You should be able to feel the play/lash at the steering wheel when the car is stationary, and also notice, when in motion, that turning the wheel slightly has little or no effect on direction.

Check the universal joint by having a helper turn the steering wheel from side-to-side whilst you watch the UJ for (tiny) flexing movements. They may be small



**10-12-1** You may find the differences between the larger chrome bumper universal joint (nearest the camera) and a rubber bumper steering rack interesting.

and seem insignificant, but remember that wear in the UJ is multiplied several fold by the time the rim of the steering wheel is reached. Feel for movement in the UJ, (**Warning!** - you need to be sure your partner does not turn the steering wheel too far or too quickly thus trapping your hand!) If the UJ is worn it's easily replaced, although you'll have to drop the rack forwards for a few minutes by removing it from the front crossmember.

If the UJ is not showing even the smallest sign of play, then the play must be in the rack. On the off-chance that the rack is not securely fastened to the front crossmember, check the four rack mounting bolts. If tight, there's a wear problem within the rack: buy a service exchange rack.

**10-13-1** Service exchange steering racks are readily available at reasonable cost, and come pre-filled with the correct grade of oil and new gaiters. Order a new

# PROPSHAFT, REAR AXLE, REAR SUSPENSION & REAR WHEELS



12-8-1 (Picture 3) It looks as if this central tube has separated from its bonded rubber bush, and certainly needs replacing. Since the spring also looks well used, this is clearly a case for a new pair of rear springs.



12-8-1 (Picture 4) Order a complete kit, as shown here. Safely support both car and axle, and change one spring at a time.



12-8-1 (Picture 5) In addition to the front eye fastening, remove the two U-bolts...



12-8-1 (Picture 6) ...and the rear shackle, seen here with the sideplate removed.



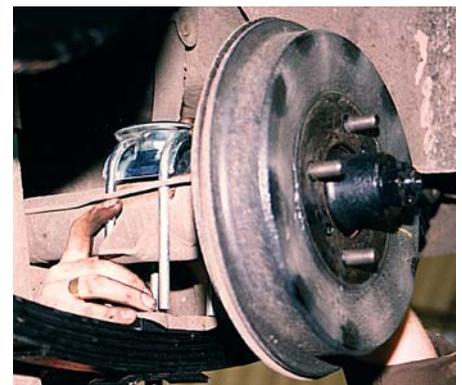
12-8-1 (Picture 7) Use lots of copper-based grease at every stage of reassembly, and remember that the springs are heavy; get help to offer up each replacement.

they've perished and are neither locating the rear axle as you would wish nor providing the cushioned spring movement important to reasonably silent rear suspension. If an eye bush has perished you'll need to replace **both** rear springs. The springs come with new bushes in place and will transform the drivability of your car if the old springs were "past it".

I must tell you that removing a pair of rusted rear springs from an MGB is high on my list of hated jobs and one you may be very wise to subcontract to your



12-8-1 (Picture 8) You may need to compress the spring to lengthen it sufficiently to get the shackle into place (before fitting the plate)...



12-8-1 (Picture 9) ...and to drop the axle to marry it to the spring...



12-8-1 (Picture 10) ...Finally, tighten the eye bolt with the car's weight on the axle.